Chelmsford Amateur Radio Society

Newsletter

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Next meeting: 5th April - 7.30pm, Oaklands Museum

'2MT Writtle - The Birth of British Broadcasting' - Tim Wander, G6GUX

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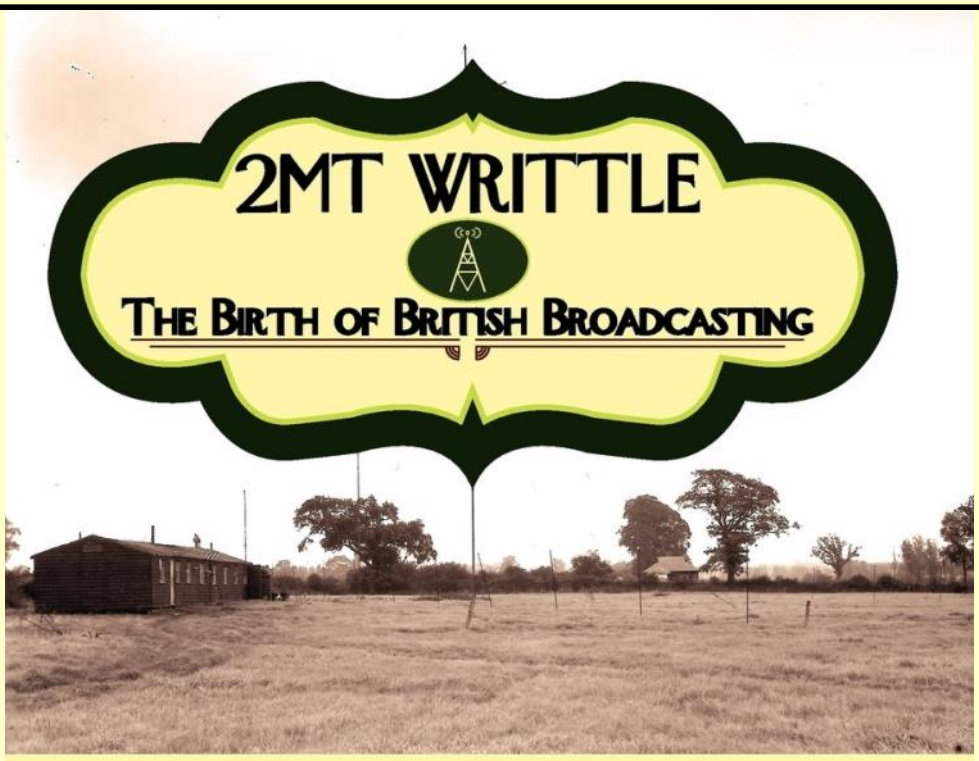
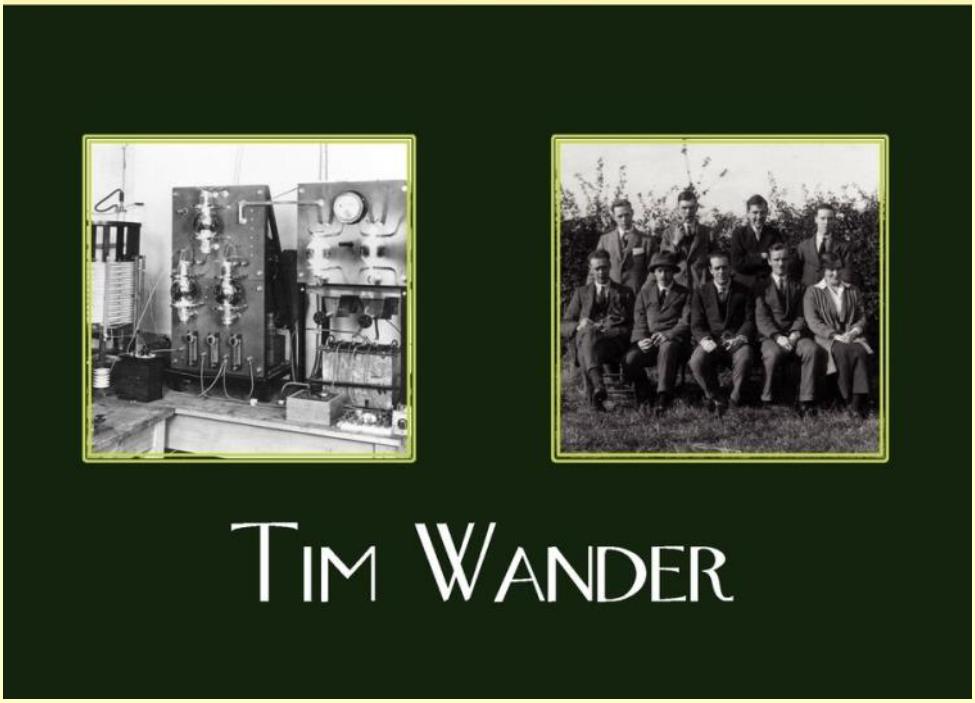




Club Nets - Tuesdays 20:00h
Net Controller: TBD

#2 - GB3DA	12th April
#3 - GB3ER	19th April
#4 - 80m 3.756MHz	26th April
#5 - 160m 1.947MHz	n/a

Essex Ham Net
Mondays 20:00h GB3DA

Contact details for the newsletter: editor@g0mwt.org.uk

Editorial

Hello again, and welcome to the latest edition of this newsletter. Last month's talk has again generated an email chain on the subject of the Post Office Tower and various reminiscences, Actually, I like getting these pushed through to me. They send me off on little journeys of discovery through the interweb, where I get distracted for hours (and there's Mara, thinking I am doing something useful on the PC).

Dave, G4MUS pointed out an error in his article last month, wherein he incorrectly attributed the call G4CVI to himself; it should have been G4MUS, of course, just as he signed himself off. I should have spotted the inconsistency!

Peter Chadwick, G3RZP has *again* responded to an item in the last issue, with a different take on PME. Another nice piece for me to reproduce. Thanks, Peter.

We have a shiny new Facebook page which can be found by following the links that are scattered around the document and our YouTube channel has been updated to allow longer videos to be added. Thanks to those concerned, and please support the media by visiting the relevant pages regularly!

Training has taken a bit of a hit recently, with fewer people than we would have liked signing up for the intermediate course but, on the up side, those attending can expect individual attention!

Please see Andy's note elsewhere in this rag about CW classes starting again on 7th April. The classes are very good natured and great fun, as well as being beneficial to both life and operating skills. If you are no longer in the first flush of youth, you are not alone and it helps keep the grey matter going! - ***Ed***.

Dates for your diary

Please note, the dates may be subject to change...

Mon. 18th April	Skills Night, Danbury Village Hall
Sat. 23rd April	GX0MWT - Operating at Sandford Mill for International Marconi Day
Tue. 3rd May	Meeting - "Introducing Moon Bounce" - John Regnault G4SWX
Mon. 16th May	Skills Night, Danbury Village Hall
Sat. 28th May	Waters & Stanton Open Day
Tue. 7th June	Meeting - Table top sale
Mon. 20th June	Skills Night, Danbury Village Hall
Tue. 5th July	Meeting - "Innovantennas" - Justin Johnson G0KSC
Tue. 2nd August	Meeting - "Constructors Competition" - Carl G3PEM
6th/7th August	Sandford Mill BIG Weekend! An interactive historical extravaganza!
Mon. 15th August	Skills Night, Danbury Village Hall
Tue. 6th September	Meeting - "Millimetric Microwaves" - Chris Whitmarsh G0FDZ
Mon. 19th September	Skills Night, Danbury Village Hall
Tue. 4th October	Meeting CARS Annual General Meeting
Mon. 17th October	Skills Night, Danbury Village Hall
Sun. October 23rd	Science Discovery Day at Sandford Mill
Tue. 1st November	Meeting - 25 minute chats (not 25 @ 1min each…)
Tue. 6th December	Meeting - Christmas Social Evening

An introduction to Tim's talk at April Club night:

2MT Writtle - The Birth of British Broadcasting

"Hello CQ - the concert's ending, ending for 2MT!"

Over 93 years ago, at eight o'clock in the evening of a cold and frosty St. Valentine's Day in 1922, regular radio broadcasting came to the British Isles for the first time. The new Marconi radio station, callsign 2MT or 'Two Emma Toc' at Writtle was to become the birthplace of British Broadcasting. But it had all started in Chelmsford two years earlier.....

The great lady herself, Dame Nellie Melba, when at the Marconi Works in Chelmsford in 1920 for her historic broadcast was shown the huge 450 ft. twin masts towering over the factory and the town. It was explained to her that from the top her voice would be heard throughout the world. Her answer is now radio folklore, *"Young Man, if you think I'm going to climb up there you are very much mistaken".* The lady sang and was heard throughout Europe, but the Postmaster General decided that Britain wasn't ready for broadcasting. Then it started again in a small Essex village called Writtle.....

A weak and static laden radio signal crackled out from an old army hut on the edge of a partly flooded field. The new art of broadcasting had come to Essex and Britain had gained her first official voice. The radio station and its 'Two Emma Toc' call sign went on to achieve their own place in the history of radio communication.

But 2MT was *so* much more than an experimental radio station. The whole thing was conceived and run by the irrepressible Captain Peter Pendleton Eckersley. A brilliant engineer, 'PPE' liked to play records pivoted at some point other than their centre, invent wireless noises, bang half filled milk bottles, invent new characters and sing bad songs....essentially a Goon show, some 40 years early.

With its impromptu comedy sketches, the first ever broadcast radio play, the first children's five minute spots, guest artistes from the London stage, burlesque entertainment's, parodies of grand opera, and a new type of entertainment radio station 2MT made history and Eckersley never suffered from the dreaded disease of microphone shyness.

The power behind the microphone, Peter Eckersley became Britain's first DJ, and the light-hearted spirit which pervaded the whole proceedings and sheer joie de vivre that bubbled across the ether, were not only a first but truly unique in the history of broadcasting. Often a one-man show, but always a team effort, the radio station known as 2MT at Writtle established an individuality all its own. The young Writtle radio engineers' work led directly to the formation of station '2LO' and then the BBC.

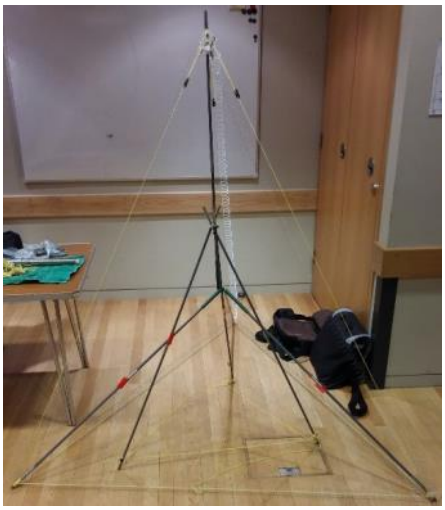
Peter Eckersley became the BBC's first Chief Engineer, taking with him most of the Writtle pioneers to build a National Broadcasting service from the ground up.

Tim will take the audience back to the days before radio broadcasting and tell the story of the early struggle to achieve a national broadcasting service in this country. From the famous 1920 broadcast of Dame Nellie Melba in Chelmsford, through Writtle's sparkling success, to the birth of the BBC in 1923.

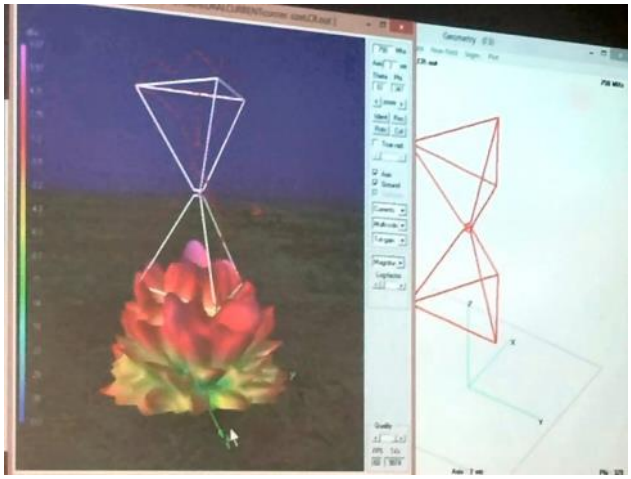
22 years ago, the first edition of *2MT Writtle – The Birth of British Broadcasting was published* and many will know that the much larger second edition was published in 2010. He is probably the foremost expert on the Writtle station and earlier Chelmsford broadcasts. He last gave this lecture to Chelmsford ARS on 5th April 1988 - *exactly 28 years to the day*, and we are pleased to welcome him to tell the story again – in the place where it all began.

March club night - novel antennas & GPO Tower history

The 1st of March saw Club night at the Oaklands Museum, Chelmsford. The highlight of the evening was a pair of presentations from our own Andy, G7TKK and Tony, G4YTG.



Andy kicked off first with an excellent talk on foldable portable antennas. He even brought along some of his own creations. The first of which, a freestanding multi-band bicone, is made from the most interesting of ingredients. Andy fashioned this antenna, weighing in at 3.5kg, from tent poles that were joined by sections of flexible hose. Perhaps the most interesting and inventive part were the radiating elements, which are made from no less than children's Slinky toys. For those not familiar with the Slinky, it is a coil of flexible metal which, when placed on the top step, can be cajoled into walking its way downstairs. Another benefit of the design is cost.



Also on display was a discone, created from an umbrella and wire. Perfect for some QRP in the rain!

Backed up by a first class set of PowerPoint slides, this antenna talk was very informative. Andy then moved on to demonstrate a free computer program called 4NEC2. This software enables the user to generate virtual antenna models, radiation patterns and anticipated effectiveness.

Using this software, Andy demonstrated that his freestanding Bicone antenna was most effective at RX but became more effective at TX the higher the frequency.

Finally Andy gave us a run down on using cheap USB radio dongles to plot on a PC screen, the location of nearby aircraft. This works by collecting the various transmissions from the aircraft on a frequency of 1090MHz and processing them through ADS-B software. A link to a tutorial can be found here: http://www.rtl-sdr.com/adsb-aircraft-radar-with-rtl-sdr/.

Homebrew "printed" Yagi and J-pole antennas using adhesive copper foil for WiFi and ADS-B respectively. I didn't actually spot the kitchen sink in Andy's kitbag, but I wouldn't put it past him, especially if it was a stainless steel one… ***Ed****.*

Moving on to the second talk of the night, Tony G4YTG gave a thoroughly impressive slide show of the building of the Post Office Tower in London. A series of black & white images demonstrated a stage by stage construction of the building. Beginning with a bed of pre-tensioned cables interwoven and presenting an upward pressure of 13000 tonnes to counter the downward pressure of the tower itself.

He explained that the tower was designed to cope with winds of 90 mph and would move by 13 inches at the top. This movement was very important to quantify, as the microwave transmitters and receivers operating through huge horns, needed to be bang on direction and elevation in order to marry with reciprocal systems dotted elsewhere.

The evening was rounded off with the traditional CARS raffle. We look forward to seeing you at our next meeting.

Paul, G7BHE

*Tony's slides came from a source who requested that they would not be publicly shared, or there would have been some more, and rather higher resolution pictures here. My thanks to Colin, G0TRM for providing the meeting pictures - **Ed**.*

Anniversaries and things

***Colin, G0TRM** sent me this*:

Last month we had our 600th Newsletter……. Here are 600 other things
600 miles = height of the ionosphere (give or take)
600 words using Times New Roman single spaced size 12 font would fill one A4 page
£600 worth of shopping was bought by a Teenager for 'coupons' and 4p was donated to charity
£600 a month and you could drive a Toyota GT 86 Coupe Special Edition
600 ml equals 20 fl. oz. or 1 pint (almost)
600 metres is the height a hill becomes a mountain (according to some sources).
£600 would buy you 236,144 Hungarian Forint
600 ohms is the characteristic impedance of open wire feeder

And some I added too:
600 ohms is also a standard audio impedance (775mV = 1mW, or 0dBm)
600 year anniversaries are known as sexcentenaries
600 Plus - the name of a Polaroid instant film and an 80's novelty AM radio for advertising purposes
600 is not prime. It is divisible by 1, 2, 3, 4, 5, 6, 8, 10, 12, 15, 20, 24, 25, 30, 40, 50, 60, 75, 100, 120, 150, 200, 300, 600
2^{600} is 4.14951556888099295851240786369 12*10^{180} (approximately)
600 = 2^3 x 3 x 5^2
600 is the product of two consecutive integers, so it is a pronic number: 600 = 24 x 25
600 and its reverse, 6, are both the averages of twin primes: 599 and 601; 5 and 7
600 is 211020_3, 21120_4, 4400_5, 2440_6, 1515_7 and 20_{12}
(*And of no significance to us at all*) 600 is the value of the postal abbreviation for the District of Columbia, DC, in the United States, interpreted as Roman numerals

Colin also asked of the Committee recently "Am I right in thinking that CARS is 80 years old in April or thereabouts, and might we have a CARS special event or a marker of some sort? Perhaps someone has already something in mind. The Spitfire is 80 years old too come to think of it".

*And **Trevor, M5AKA** added his two penn'orth:*

You are quite right Colin, CARS will be 80 years old.

It was founded by Louis Varney, G5RV and others in April 1936. Back then it was known as the Chelmsford RSGB Group, changing its name to Chelmsford Amateur Radio Club (CARC) in the late 1950's followed by another change to Chelmsford Amateur Radio Society (CARS) a few years later.

The inaugural meeting, held at the QTH of G5RV in Galleywood, was attended by 26 amateurs fifteen of whom travelled all the way from Southend-on-Sea to support the event. Back in those days Southend had a thriving amateur radio club. Eleven amateurs attended from the Chelmsford area.

The meeting was held towards the end of April 1936, but I do not know the exact date. I'm presuming it was during a weekend since there were far fewer cars in 1936 and, due to the state of the roads and performance of the vehicles, the journey from Southend to Chelmsford would almost certainly have taken far longer than it does today. **Trevor, M5AKA**

After Colin mentioned the 80th birthday of the Spitfire in March, I wondered if there was a radio connection somewhere as well. I didn't find anything much relevant for 1936 apart from1st of January – the cessation of all commercial radio broadcasting in Germany.

CARS celebrates 80 years - Trevor, M5AKA

At the end of April the Chelmsford Amateur Radio Society (CARS) celebrates its 80th anniversary. During that time the club has undergone several name changes being the Chelmsford RSGB Group from 1936-1956, then for a few years the Chelmsford Amateur Radio Club (CARC) before settling on the current name.

The inaugural meeting in 1936 was organised by Laurie Fuller G6LB who ran a Gents Outfitters in the High Street. He placed an announcement in the District 14 (Eastern) Section of the RSGB T&R Bulletin:

“With a view to forming a Chelmsford section [of the RSGB], will members living within 10 miles write to G6LB, Mr. L. Fuller, 85 High Street, Chelmsford promising him their support. If this is obtained a meeting will be arranged.”

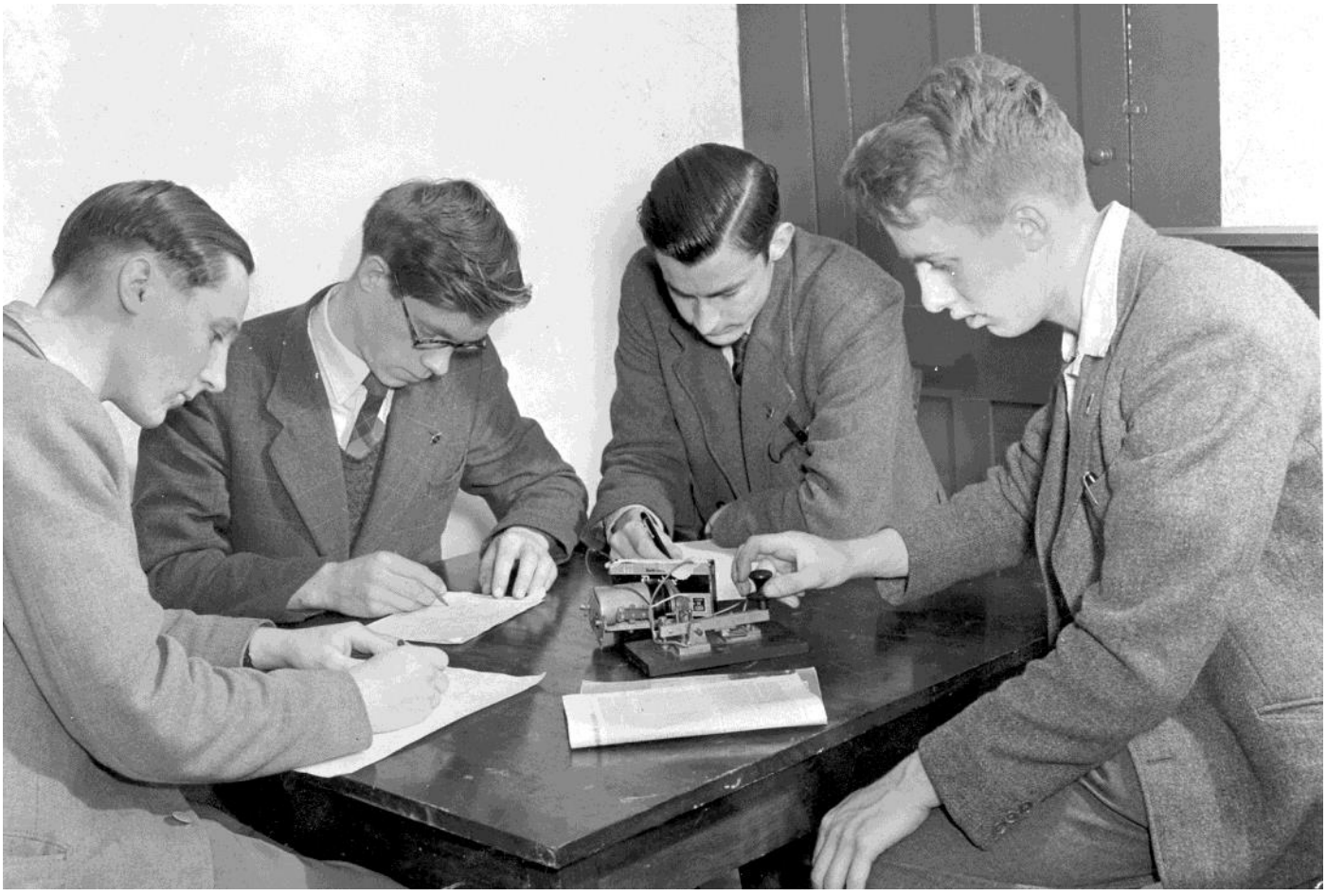
The meeting was held at the home of Louis Varney, G5RV, with 11 amateurs attending from the immediate area along with a further 15 from the Southend-on-Sea Group who travelled over 20 miles to Chelmsford to support the event.

Since those early days the club has gone from strength to strength and these days has a membership well over 100. The club's main meeting is held on the 1st Tuesday of each month and in addition Skills Nights are held every 3rd Monday with exam training courses and Morse tuition classes taking place on most Thursday evenings.

Web: http://g0mwt.org.uk/

And Morse classes were just as much fun then, as they are now!

1955 Morse Class: Unknown, G3KRB, G3KPJ, Alan Davies & G3INW



And 100 years ago...

March 7th 1916 was the 40th anniversary of Alexander Graham Bell's telephone patent. In that year air-to-ground_communication was starting to get established and Marconi started production of air-to-ground radio transmitters/receivers. This led me on to looking further at the history and I found references to the Marconi Q valve (shown below) on the MarconiHeritage.org site. Production of the Type Q started in 1916, when Marconi would have been aged 42 (on the 25th April). Further to this, I found a description of the earlier Type C valve:

The Marconi 1913 Type C valve was a soft low vacuum triode valve, with a lime-coated platinum filament, designed by H. J Round of the Marconi Company and manufactured by Edison Swan. Early examples of these valves had to be coaxed into operation by holding a lighted match under the top glass pip to assist the valve's little electric heater. Indeed, surviving examples still show these burn marks. The long top pip of the valve actually contained a small piece of asbestos which, when warmed released a gas that made the valve work much better. Signal strengths could be greatly improved by stroking the valve with a match flame, but conscientious operators apparently lost all sense of pain in fingers that soon resembled well done sausages and a new wartime affliction was born – 'burnt sausage fingers'.....

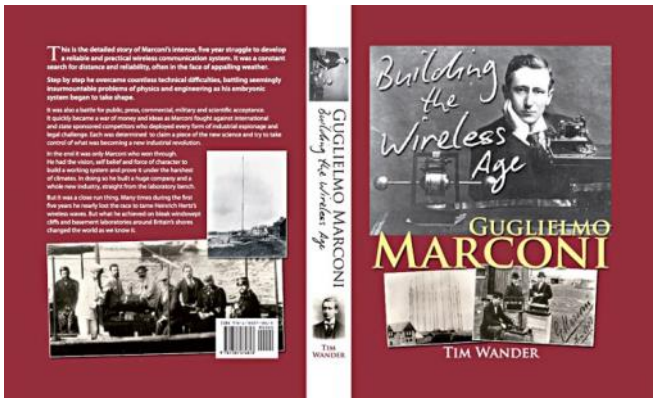
It makes you wonder that, with all the difficulties experienced by early operators, radio gained any traction at all. And then there were the headphones! Imagine sitting around listening to the radio with a long lead attached to your head and the magic box (crystal set) at home. Good job we don't have to put up with that now. - Er, hang on, wait a minute, what is that we see on the streets and trains everywhere? People with long leads attached to their heads and the magic (phone) box in public. I suppose that is an improvement of sorts; at least they don't have to lug dirty great ghetto blasters or boom boxes around on their shoulders now.

Radioactive International carries a story that in Easter week, Irish rebels took over the wireless telegraphy station in O'Connell street Dublin and declared to the world on shortwave radio, in Morse code, that Ireland was now a Republic in what was probably the first clandestine/pirate broadcast in the world.

Wikipedia has it that on March 8, 1916, Harold Power with his radio company American Radio and Research Company (AMRAD), broadcast the first continuous broadcast in the world from Tufts University under the call sign 1XE (it lasted 3 hours). The company later became the first to broadcast on a daily schedule, and the first to broadcast radio dance programs, university professor lectures, the weather, and bedtime stories.

There's nothing new under the sun... ***Ed***.

Colin also sent along this short item about Tim Wander



I had a birthday recently and my son and his family gave me a most welcome present - Tim Wander's latest book, Building the Wireless Age. I have only just received the hardback special edition, singed by Tim. (*That's a pity Colin. You would have thought that for a special present, he would have taken care and just signed it for you! - Ed.*) It has some 750 pages and is 2" thick and weighs over 4.5 pounds, so not a volume to be taken lightly and not really suitable for bed time reading. So far I have only scanned the main pages, most of which contain, so far, many previously unpublished photos and text, so I have much more reading ahead of me.

For further information see http://www.marconibooks.co.uk/magic.php **Colin, G0TRM**

Booklet printing revisited

*J. P. Gilliver (**John, G6JPG**) [Yes, not a coincidence] also replied with further advice about the booklet printing article:*

I too have long been an advocate of A5 booklet printing; thanks for your tip about using a rubber or cork if you haven't got a long-throat stapler.

You do say, though, "if your printer has the capability". Unless we're talking teleprinters, golfballs, or daisy-wheels, though, I think all printers, in theory, have the capability: it's just a matter of finding suitable software. If you're lucky the printer driver will include it, but most don't.

I was only thinking about the lack of capability of certain printers to print double-sided and the necessity to manually turn and re-feed the paper, but I was unaware of stand-alone software. Thanks, John. ***Ed.***

Last time I looked, which was several years ago, there was a piece of software that would do booklet printing on any printer - but I think the free/evaluation version only did up to 8 sides, you had to pay to get one that did more.

Some pieces of software will do booklet printing, but only for their own output; Adobe Acrobat XI (and possibly earlier versions, and maybe other PDF viewers) has it built in, so one solution is to "print" to PDF (I use pdf995, but most of the utilities that make PDFs are similar), then print that - but it's tedious (though still worth it for anything big). If anyone knows of a good free booklet software, do please share!

At John G6JPG's suggestion, here's my starter for four… ***Ed***

PdfBooklet is freeware that allows you to perform all sorts of tricks with existing .pdf documents. Some limitations are noted on the homepage, but those would only really apply to big or complex jobs. Anyway, it's free, so you have nothing to lose but your download allowance… (It's only 12Mb anyway). The supplied hyperlink takes you to a page that is designed to draw your attention away from the real download source at the top of the page. In fact, that link goes to the source, where the file is referred to as Pdf-BookShuffler and is also available from other mirrors.

Gimposition is a small (<1Mb) free Windows software which alters the internals of a PDF file to change the page sizes, orders, orientations etc. It looks like it does a very similar job to PdfBooklet. Your choice.

Blue Squirrel ClickBook for Windows is possibly more advanced but is not freeware. $50 may look pricey in the face of available freeware, but seems very comprehensive. If, however, you wanted to do the sort of things it is capable of, you may already have the facility in the software you use to create the documents.

BookletCreator looks likes a very simple affair, but information is scant and I would be loath to pay the $20 asking price for software that can't be bothered to explain itself! .

After I sent this out to my army of proof readers, I got the following from Trevor, M5AKA:

Regulations for applications for wireless telegraphy licences

On March 23 Ofcom published a decision on regulations which determine applications for wireless telegraphy licences.

2.4-2.6 of the Ofcom statement acknowledges the contribution of radio amateur **John Gilliver G6JPG**. They say *"we have not adopted the changes proposed by Mr Gilliver regarding merging specific conditions in the Amateur Radio licence but will consider these the next time these licences are updated."*

The Ofcom announcement says:

The changes cover the aeronautical, maritime and satellite services sectors, and bring these procedures into line with policy decisions taken since 2010. They also remove requirements on prospective licensees to provide certain information that is no longer relevant within Ofcom's current policies and practices.

This is a statutory notice of Ofcom's amendments to the Wireless Telegraphy (Licensing Procedures) Regulations 2010 (S.I. 2010/1823).

These amendments also relate to updating the Wireless Telegraphy Act Licences (Terms, Provisions and Limitations) of July 2010.

Today's document includes a sample licence for each class of licence to which it applies, showing the terms, provisions and limitations that apply.

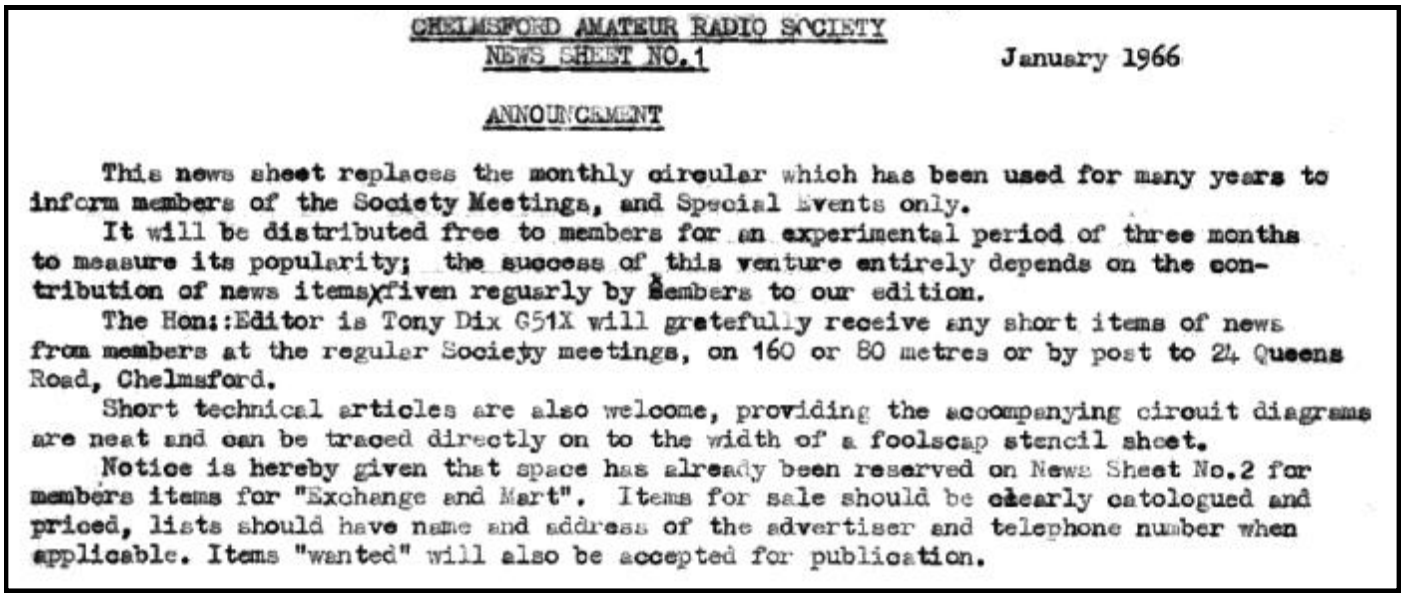
Download Ofcom's Wireless Telegraphy (Licensing Procedures) (Amendment) Regulations 2016 statement at

http://stakeholders.ofcom.org.uk/consultations/amendment-regulations-2015/statement/

Addionally, **Murray, G6JYB** said of booklet printing, that he uses the free Adobe PDF reader, which is, of course, free. He is quite correct, but the others referred to are supposed to offer a greater degree of control over the document that is already rendered in .pdf format and that can't otherwise be altered. If not, then there is, as Murray says, no point in messing about...

Further, he said that it is 50 years since the first Newsletter was published in January 1966. It's a pity I missed that in the centenary edition last month, but here is a copy, shamelessly ripped off the CARS website.

Its initial three month trial run obviously succeeded, but it is interesting to note that items were to be accepted over the air! The type of content, be it news, technical, for sale & wanted is still the same and, as any editor knows, the pleas for contributions will never cease to be a page filler… ***Ed***.



CHELMSFORD AMATEUR RADIO SOCIETY
NEWS SHEET NO.1 January 1966

ANNOUNCEMENT

This news sheet replaces the monthly circular which has been used for many years to inform members of the Society Meetings, and Special Events only.

It will be distributed free to members for an experimental period of three months to measure its popularity; the success of this venture entirely depends on the contribution of news items given regularly by Members to our edition.

The Hon:Editor is Tony Dix G5IX will gratefully receive any short items of news from members at the regular Society meetings, on 160 or 80 metres or by post to 24 Queens Road, Chelmsford.

Short technical articles are also welcome, providing the accompanying circuit diagrams are neat and can be traced directly on to the width of a foolscap stencil sheet.

Notice is hereby given that space has already been reserved on News Sheet No.2 for members items for "Exchange and Mart". Items for sale should be clearly catalogued and priced, lists should have name and address of the advertiser and telephone number when applicable. Items "wanted" will also be accepted for publication.

CARS at Sandford Mill on Saturday 19th March

Supporting British Science Weekend

The day started early with collecting the trailer, having first packed the car with all the necessary equipment for the day. Arriving at Sandford Mill with time to spare, we eventually got in with just enough time to set up before the public were allowed in at 10:00a.m. Andy, G0IBN and Oliver, M0WAG assisted by Carl, G3PEM set up the HF station in the Marconi Hut, later to be joined by John, G8DET. After a small technical issue was corrected the HF station worked very well, the issue being a broken feeder line outside, resulting in poor VSWR and power output. All the contacts were made in CW as no one came in to use phone on this occasion.

Outside (in the cold) we had an event shelter set up for the 2M operation along with activities to interest the younger members of the public, like radio controlled cars, an electronics kit (Snap Circuits) which is always a big hit with the inquisitive children and a good talking point with the parents. The 2m station preformed well with contacts out to Norfolk being the furthest. Operators in the cold were Les, G4JDS, Jim, 2E0RMI & Brian, 2E0WHB, with visitors Bob, G4MDB and Ray, 2E0GVE amongst others. Andy, G7TKK had several PC based systems up and running, using an RTL-SDR USB dongle for receiving ASDB signals for tracking aeroplanes, and another for radio reception.

Unfortunately Peter, G3SUY and his Marconi 1154 TX and 1155 RX set up was unavailable on this occasion due to unforeseen circumstances but, hopefully, will he and they be back on the menu at a later date. Overall, a very nice event and many thanks to all who helped out in the running of the day.

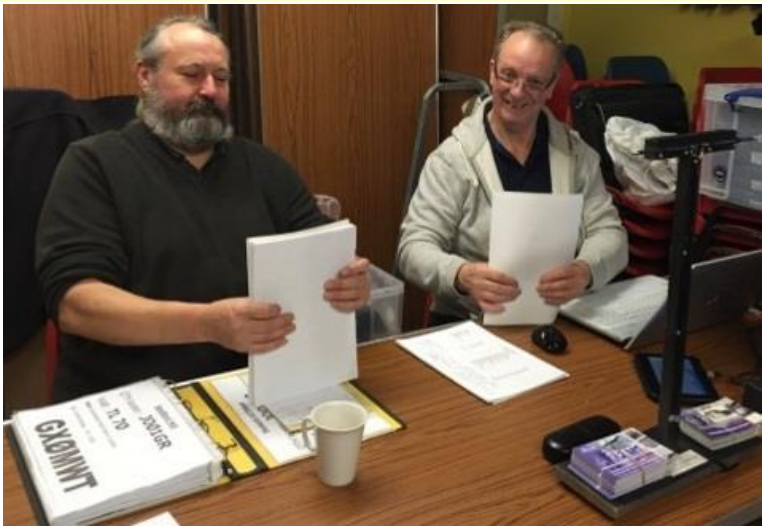
Our next Sandford Mill event will be the International Marconi Day on the April 23rd 2016. You are most welcome to join us; all are welcome and all help is gratefully received. Operators are in short supply at present, so please consider helping out on the day. Required will be CW & SSB operators, loggers (for the log book side of things) or all three. Please see the website for timings for IMD. Just drop Chris, G0IPU a line to say you are coming and with what, and where, you would like to help out. **Chris, G0IPU**

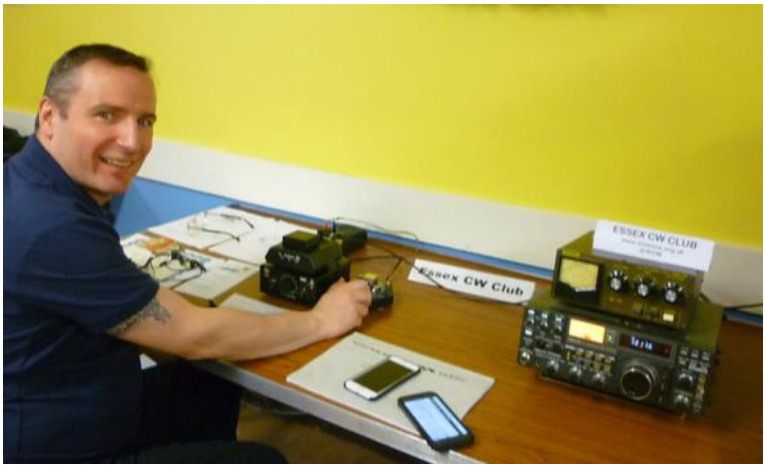
Skills Night, 21st March 2016

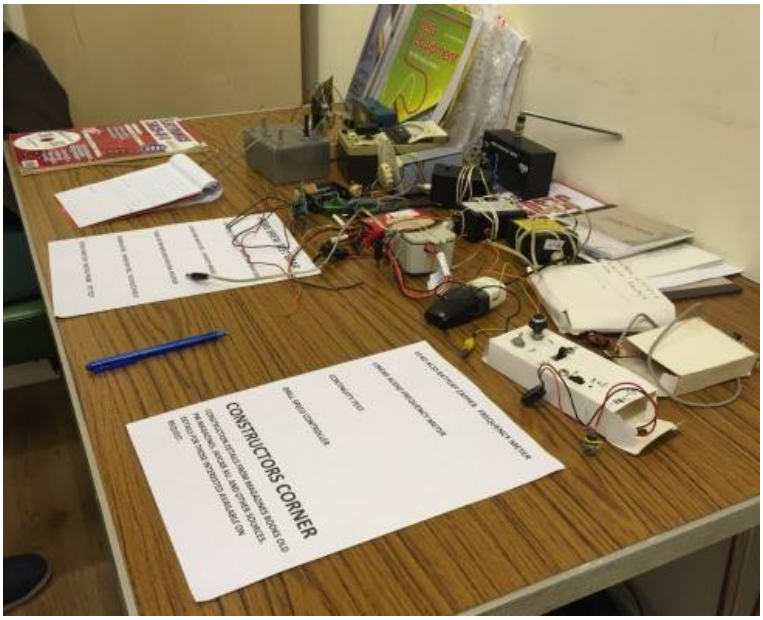
This is the first Skills I have missed for a while - I was on a disastrous couple of days away and would rather have been there, but that's life, I guess.

Membership chores, constructor's corner, Essex CW club and a plethora of dongles, there seemed to be plenty of things to engage and generate lots of discussion amongst the visitors.

I'm sure one of those would be useful if I could get to grips with it!







Melvin 2E0DNS brought along an interesting collection of bit of test equipment he's used over the years to make repairs on AM radio receivers. His display was hopefully of interest to those looking to get started in the world of construction.

Thanks to Essex Ham and CARS for the content - ***Ed***.

Exam passes

My apologies for the last newsletter issue and omitting to reflect the result of the recent Foundation and Intermediate exams that were taken at Danbury Village Hall recently.

Successes were recorded in both exams, and the next course will have started by the time you read this!

Good luck to those participants and let's hope that some of the Foundation candidates go forward to the Intermediate. Next stop: Advanced prep. classes and Practicals Workshops in June/July.

The first amateur radio PME installation?

In about 1951 or 2, the Worksop and Retford RSGB Group operated NFD from the Leverton Hills, on the east Nottinghamshire/Lincolnshire border. Harold, G3BTU, owned the generator. Imagine two 6 foot long, 6 inch wide and half inch thick planks of old weathered wood, joined by strips of 1.5 by 1 inch wood, the whole supported in the middle on a pair of old pram wheels. There was a US surplus 'Onan' petrol engine in the middle, a modified jerry can for a fuel tank at one end and two generators each about 18 inches in diameter and the same long, sitting side by side towards the other end. Pulleys and vee belts allowed the generators to be driven from the engine, while there were no guards to prevent fingers getting caught – 'elf and Safetee would have had several fits! The generators produced 115 volts and there were two transformers in steel boxes about 18 inches cube to get 230 volts. The output at 230 volts was on those horrible PYE coax sockets, the transformer cases and outers of the Pye sockets were the neutral and connected to earth stakes and the feed to each station was in war surplus, half inch diameter coax, purchased as scrap – "That theer brahn wire, mester, that's arf a crown a roll', a roll being about 150 feet. ('arf a crown' = $12^{1}/_{2}$p) The 'neutral' of the 'mains' was earthed at the ends of the run, and at that time, this was all considered highly dangerous and 'not allowed': now it's considered 'best practice'…….well, almost!

So we had a 'PME' system, with a 'TNCS installation' long before it was generally thought of……although no RCD, as they hadn't yet been invented! The Worksop station used G3HKQ's Panda Cub transmitter and half an hour into the contest, there was a small explosion in the transmitter as an electrolytic gave way, with usual smell and mess. G3BTU ran a radio TV repair business, so over to his van for a spare. About 30 minutes later, there was a repeat performance and as they had about finished replacing the electrolytic for the second time, the future G3RZP enlivened the shining hour and increased his popularity by asking 'Daddy, Daddy, will it do it again?' At which point, it was decided that it was past bedtime for a 5 year old…..and we went home! (In those days, NFD ran from 1800 Saturday to 1800 Sunday)

G3HKQ lived in a colliery village with free electricity from the pit: the only problem was that it was at 180 volts so the mains taps on the transformers were set accordingly, and applying 230 volts led to objections!

Peter, G3RZP

I looked up Onan generators (right), as I had never heard of them and was intrigued by the name. There have been some marketing disasters with inappropriate brand names, but the Biblical reference seems to have been glossed over in this case! ***Ed***.

Kent Digs Marconi

I was talking to a friend of mine recently about the CARS meetings at Oaklands and, as he is both a Friend of Chelmsford Museums and an archaeologist, he mentioned an item he had written recently for FCM magazine regarding Marconi's experiments at Dover. If anyone is interested, I reproduce it here:

Members with a particular interest in the development of radio by Guglielmo Marconi may be interested to know about archaeological excavations carried out by the Canterbury Archaeological Trust in July/August 2015 at the South Foreland lighthouse, St. Margaret's, Dover (reported in the Kent Archaeological Society Newsletter 102, Winter 2015, 20-21).

This iconic lighthouse was formerly run by Trinity House, but since1988 has been in the ownership of the National Trust and is a popular visitor attraction/destination for walkers on the White Cliffs of Dover. The excavation of a series of fourteen small trenches within the grounds of the lighthouse was undertaken as part of the preparation of a Conservation Management Plan for the lighthouse and its immediate environs. They were designed to assess the extent and nature of any surviving archaeology; this related directly to the lighthouse, previous lighthouses, known historical activities at the site or earlier features. A significant discovery, was part of the concrete base for Marconi's direction-finding radio emitter set up on the slope in front of the lighthouse in the early 1920s as part of a ground breaking experiment.

South Foreland was also the site for a number of earlier experiments by Marconi. On 24th December 1898 he began the first tests of ship-to-ship communication between the Trinity lighthouse and the East Goodwin lightship. The value of these was reinforced on 28th April 1899 when the SS R.F. Matthews collided with the East Goodwin lightship and the first ship-to-shore distress message was received at the South Foreland lighthouse and relayed up the coast to the Walmer lifeboat. In 1899 the lighthouse was used by Marconi to receive the first international transmission sent from Wimereux, three miles north of Boulogne in France.

The Marconi Company used the South Foreland lighthouse in September 1925 for an experimental transmission of a radio guidance system. The hut from which this transmission took place appears on photos held on the St Margaret's village website. They also show the Rotary Beam transmitter, installed in 1923, designed to assist ships to pinpoint their location. Although it was demolished in 1932 the base remained and it was the site of this that was relocated in the recent excavations. It is understood that the National Trust has created a replica of the Marconi hut used for many of the experiments and that this will be filled it with historic radio equipment in an effort to tell the story of how radio developed.

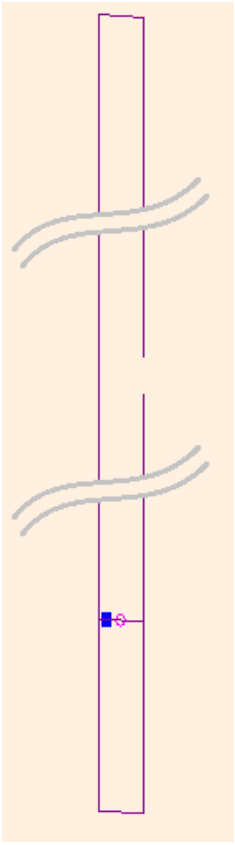
For more information on South Foreland visit the Canterbury Archaeological Trust website at www.canterburytrust.co.uk.

Note: A Marconi Exhibition is running from the 1st March 2016 for three months at the original Marconi Wireless and Telegraphy Works, Hall Street, organised by the Chelmsford Civic Society in collaboration with BBC Essex.

Dave Buckley Bsc., MIFA, FSA

The Slim Jim 450Ω feeder antenna revisited

I said in a previous issue that I could not arrive at an *exact* solution for a 50Ω match and puzzled why I found a discrepancy between my results and those that others were (apparently) getting. It niggled me, so I set about checking again by modelling & re-measuring the feeder. In the February '16 RadCom, Andy Talbot, G4JNT suggests using a 50Ω feeder load instead of open or short to determine the Vf of an indeterminate feeder, so it will present a high SWR at frequencies that do not correspond to $\lambda/2$, whereas the reflected 50Ω may enable a more accurate measurement to be made when the frequency at $\lambda/2$ is achieved. Using this method, I got identical results, so all was OK.



Using 4NEC2, in order to inject a voltage feed, you have to put it in series with a wire or a segment of a wire (magenta circle in the graphic). As the Slim Jim is fed across the (2cm) width of the feeder, the only way to inject it is to add a wire across the feeder at the desired position. Having asked around what the effect of that wire would be on the model, I was met with blank stares or shoulder shrugs, so I set about evaluating it.

Now: on to the next part(s) of the puzzle. I had also previously asked why the 25mm dimension for the gap is (normally) chosen, and why did it not stack up with my previous findings that a much smaller gap would prove beneficial. Additionally, I wondered what the effect of that on the $\lambda/2$ radiating element length would (or should) be. There were two things that influenced my decision to change the gap to 2cm: a) I believe a smaller gap is better and b) if it is too small, then there is a conflict between the requirement for all wire segments in the model to be within the ratio 1:5 of each other (e.g. 1:1 or 1:2 etc. is fine). I had set the auto-segment to give 100 segs. per wavelength, so each one in the main elements would be ≈ 2cm. I could choose a greater number, but calculation time would increase.

After making sure that the required $\lambda/2$ and $\lambda/4$ dimensions were pretty much exact for both the radiating and matching section, I set the feed position near where I got the best match before. I looked carefully at the results and found that there was no coincidence between the resistive feed impedance and reactive zero to give the elusive 1:1 theoretical SWR. I did, though, find that the best position for 50Ω resistive coincided with an inductive reactance of about 15.6Ω. The simple way to eliminate that was to insert a negative series reactance (capacitor) also in series with the feed wire (at the blue square). The result? Happiness, as Mr. Micawber would have said.

So: XL of 15.6Ω at 145.5MHz? 17nH. The inductance of 2cm of wire? Well, a rule of thumb is ~20nH/inch (25mm), so 20 * 20/25 ≈ 16nH. Hardly surprising, is it? My guess that the inductive reactance of the feeder tails is offset by a net capacitive reactance at the feedpoint found experimentally in practical examples, seems correct after all. At least I have an answer, but it's a pity it is still only empirical. Also, I now know that if you inject a voltage in this manner, better make sure it is part of the active element, or that is electrically small enough to be insignificant, and can be ignored!

If the feeder V_f is accurately determined and modelled, I should be able to scale this for a 70cm antenna and get similar results, right? I couldn't scale the feeder width dimension, but I had freedom to scale any of the lengths or the match position.

Also, I thought again about that pesky gap, and then it dawned on me... If the radiator length is $\lambda/2$ and I treat the shorted feeder as part of a folded dipole, and the width of the shorted end is subtracted from the parallel wire, then the gap should be 2cm! Just as in a folded dipole, should the folded section serve to raise the impedance without affecting the resonant frequency of the radiating element? With this information, and the 2m version optimised to 1.033m radiator, 51.03cm stub and 50mm match, the start point for 70cm was 34.21cm radiator, 17.11cm stub and 1.7cm match. This optimised to a 1.8cm match position and 6.8pF series capacitor. At last! I am happy now (I think) I finally understand it!... ***Ed***.

DAB+ - Digital Radio changes coming soon

See below from http://dtg.org.uk/news/news.html?id=5581

For information, the new stations are on the new 'Sound Digital' Multiplex 11A on ~217 MHz which should be within the tuning range of most DAB radios, though of course you will need a more modern receiver (or a firmware tweak) to enable the DAB+ ones. If you do buy a new DAB radio make sure it has the new tick mark….. (which includes DAB+ and is ready for radio switchover when BBC et al leave FM).

Likewise make sure any new TV you buy has this FreeviewHD logo or it will lose channels in a few years time… (N.B. - FullHD, HD Ready etc., mean nothing at all as far as a compatible tuner/chipsets are concerned).

When is the next lot of switchovers? Probably 2020 for both (Ofcom/EU have already announced - end of 2021 for having the TV frequencies freed up for 700 MHz mobile phones).

++

On March 1st, Drive to Digital 2016: National Now marked the biggest launch of digital stations across the UK with the official switch-on of the second national DAB commercial network. In addition to the 18 new commercial radio stations, there's been an expansion on existing DAB networks, both nationally and locally, to reach FM equivalent coverage.

The new network also brings with it the launch of the first DAB+ stations in the UK, Jazz FM, Fun Kids and Magic Chilled. DAB+ is widely used in countries around Europe and globally as it offers improved spectrum efficiency in comparison to DAB; allowing more radio stations for the same capacity or higher audio quality for the same capacity.

Radios that have the DAB tick mark are DAB+ compatible meaning they can receive the new DAB+ stations as well as being able to receive DAB stations.

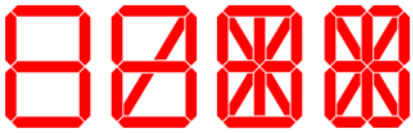
Secretary of State for Culture, Media and Sport, John Whittingdale, switched on the Sound Digital DAB network and showed full Government support for digital radio and the achievement of the coverage.

This follows the recent release of changes to the DAB tick mark requirements that will soon be extended to a European-wide specification. The main changes from the current specification are:

• All Band-III frequencies will be tested for sensitivity requirements – meaning 38 channels tested instead of 12;

• The DLS requirements have been expanded to include all European Latin-based characters; and

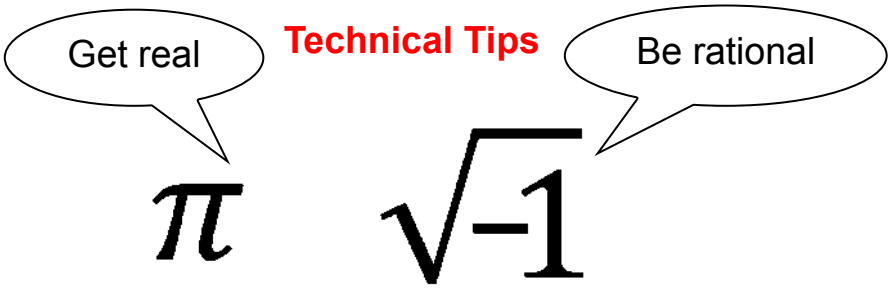
• There is now a requirement for radios using a starburst (14 segment) display to map the characters mentioned above in a specified way - Previously it was not specified how starburst displays had to map special characters.



The common segment displays shown side by side: 7-segment, 9-segment, **14-segment** and 16-segment displays.

Murray, G6JYB

Technical Tips



Free to a good home!

Several PCs that have outlived their usefulness. They are old, quite big and heavy.

Dell Poweredge 600SC P4 ?GHz 40Gb HDD 512Mb RAM

Dell Poweredge 600SC P4 1.8GHz 40Gb HDD 512Mb RAM

Dell Poweredge 600SC P4 1.8GHz 40Gb HDD 4Gb RAM

Dell Poweredge 1600SC 2 x Xeon ?GHz 60Gb HDD 2Gb RAM 2x Ethernet cards

Dell Poweredge SC420SC Celeron ?GHz 80Gb HDD 3.5Gb RAM

Dell Poweredge SC420SC Celeron ?GHz 80Gb HDD 1Gb RAM

Dell Poweredge SC420SC P4 ?GHz 150Gb HDD 2Gb RAM

All have win 2003 servers s/w, but different flavours; some are web servers, SQL servers and std. servers

Contact **Alan, M0IWZ**: alan.hanna@bitea.com or 07813 135652

The agony and the ecstasy

You know those yoghurt pots with the foil lids and, how, when you tear them off, they don't always come off cleanly, leaving small slivers of foil adhering to the rim of the pot?

I was rinsing out one to put in the recycling recently and caught my forefinger on just such a piece. A very minor cut, a bit like a paper cut ensued. Normally, no problem, apart from the fact that it won't heal and is getting pretty sore. It's causing me agony as I type this newsletter so that you, dear reader, can achieve ecstasy in reading it… ***Ed***.

Morse classes starting again

Thursday evening Morse classes will be starting again on April 7th, after the Easter break.

Whether you are a beginner or just want to refresh your CW skills, you would be made very welcome.

Classes start at Danbury Village Hall at 7pm.

Just come along, or you can email me on g0ibn@kersey1.freeserve.co.uk or call 01621 868347 for any further information. **Andy, G0IBN**

Feedlines (page fillers)

Coax: (Usually mispronounced as two syllables). A term applied to the manoeuvring of a piece of transmission line through the attic or walls of a house.

Characteristic Impedance: The usual reaction of your spouse when told about the proposed antenna system.

S.W.R: A term, applied to any part of the antenna system, which means: "Savings-to-Watt Ratio". Based on the inverse relationship of money in the bank and effective radiated power.

ATU: A device mistakenly believed to allow you to load up into a mismatched antenna from the shack. Unfortunately, it is only the cost of one of these that lowers your S.W.R.

Trap: Device installed to collect rain-water, to keep it from running further down the antenna.

Post Office Tower memories

John, G8DET emailed about Tony's talk last month and that sparked off another chain:

Some lovely photos there. Nice one of Tony and David Bolwell, G3JCM looking at the PO Tower. David was working at that time, I think, for GEC who actually made those horn aerials. They were pressurised with 9lb/in^2 of dry air to keep water out, but the "cloth" across the face got damaged – was this by a sparrowhawk? And as Tony said – water would then get in and upset them.

My personal PO Tower pictures may be of interest; because it was a restricted area there are very few in existence but, of me? No! It is to show that besides Tony who was in charge of it, Colin, Dave and myself were also involved – and another CARS Member had a Tower story.

This cable duct goes down a few hundred feet to go under the Thames – the stairs go underneath each other. The engine, I think, was one of those Tony mentioned.

John, G8DET in Museum Telephone Exchange and looking down underneath the PO Tower.

The photo below (right) was taken sometime about 1974/5 from floor 34 in Euston Towers at the top of Tottenham Court Road, where I used to have lunch with my daughter. The photo of Euston Towers was taken from the gallery that Tony said was above the restaurant on the PO Tower.

I was the Clerk of Works at Wootton-Under-Edge Radio Tower in 1962 or maybe 1963, next one from Sparsholt Firs (towards London) with Bristol Patchway next away from us and London.

We had a concrete tower with no windows, 251ft. high, with Dave's Horns looking in both directions.

What Tony did not say was that Wedgie Benn, who was Postmaster General at that time, was given the document to sign to build it, but said he was off to Japan on a fact finding mission – he said he would do it later, when he returned. After he came back he looked at the drawings with the Post Office Engineers who were talking him through the project and he said "Where is the revolving restaurant?"

They said something like “This, sir, is a microwave tower and it does not have a restaurant”. He said “No restaurant, no tower – all the towers in Japan have a restaurant”. They had to redesign it to include the restaurant, and add the mesh of steel and concrete at, I think, the 35 ft. point attached to the Museum - to strengthen it from swaying with the extra weight at the top. You can see this slab of steel and concrete sticking out from Museum Exchange on every photo.

At the same time he was given a piece of paper to sign for a £multimillion order for more lead covered CJ cables; it was always about the same money each year. He asked “what is this for?” and the PO engineers said “to provide more circuits between towns”. He said “when I was in Japan they nearly kissed my shoes saying “A.H. Reeves very clever man – he invented PCM – no need for more CJ Cables”. Wedgie would not sign and the cable companies nearly went out of business that year with no orders (the GPOT had to order some the next year) but Dollis Hill had to produce 24 Channel PCM to stick down existing CJ cables. GEC, Plessy and STC all produced different designs, which were very involved and cost a fortune. After a couple of years Marconi tendered just over half the price, got a huge contract and wiped the floor for years. I installed the first 24 channel Marconi system in Gloucestershire. To Marconi it was like switching DC, but to the conventional companies it was like VHF radio with wires! Marconi wired it with open wire while the rest used bundles of coax cable with all the problems created there.

Maroni sold this system worldwide – I saw it in use in Malta – and it was so reliable, the chap showing me around forgot where it was installed! The Italian version had all its covers off and the tables all around were covered in diagrams – it went wrong every few days. Then Martlesham produced a system to the Euro specified 32 channel PCM which Marconi made, which in my mind was not so successful, but had to conform to the international standard to sell worldwide.

In 1968 I went to the BBC and met E.R. Rout who invented “Sound in Sync” for BBC TV – but that is another story (and no space *for the piccy - Ed*.) I remember going to the IEE, Savoy Place in 1969 to a lecture by A.H. Reeves on PCM – very interesting. Memories!

Dave, G3JCM being copied in to the email, replied:

John, Interesting to see the pictures of the BT tower - attached are two pictures taken from the bare antenna platform. I can’t see any safety belts ! We called the tower at Bristol Purdown in those days - I don’t think the patchway motorway existed then. The G.E.C. dishes were made by a firm Precision Metal Spinners from Stratford on Avon to a Coventry design. The horn reflectors were made by a firm on the south coast whose name escapes me - I think Pirelli were involved.

And finally, back to John:

Dave, You are absolutely right – it was called Purdown but I could not remember it. My Aunty ran a large farm near the bottom of the hill with the Wootton Tower on and I used to often have lunch with them.

She once asked why they built the Tower where they did. I did not know, so I phoned the London Engineering Headquarters and asked the project manager. He asked why I wanted to know, but said they simply stick a pin in a map and scribe the area where the propagation shows they need a repeater, look for, and choose, suitable locations.

My Aunty wanted to know whether they ever consulted “locals” or went to a local pub and asked them there. He said “never”. I told him my Aunty reckoned they had put it on the wrong hill – that one is often covered in cloud and mist while the other hill nearby never is. The cloud and mist rolls in from the Avon and Bristol Channel on the prevailing SW wind and “forms” over the hill with the Tower on.

With that, as I am speaking to HQ, the carrier failure alarm rang out to show the mist had caused a total failure from Sparsholt Firs! The engineer thanked me and said that I had opened up another avenue in the selection process. Ten years later he supported my application to join the Institute of Electrical Engineers! This was when I was working in London Headquarters.

Thanks for the feedback. Lovely picture of the Tower and, as you said, “before Elf & Safety” got going.

John, G8DET

Open platform for better views around the place. Who needs safety netting anyway?

A nice wet surface and trip hazard to help the trade at the local hospital—after all, the doctors 'n' nurses sometimes had to do real work when the linen cupboards were full...

*The engine, Euston Towers and London's very own (slightly) leaning tower! - **Ed**.*

International Marconi Day at Sandford Mill

Chelmsford's former waterworks at Sandford Mill is primarily a museum collections store and science education resource. However, it is open to the public for special events during the year.

Sandford Mill has featured in TV programmes such Great British Railway Journeys and The Wave Messengers. The building houses an extensive radio collection, with some equipment dating back to the 1890's. There is a series of five ship's radio room displays representing different decades including some very rare Marconi equipment from ships contemporary with the Titanic.

On Saturday, 23 April from 10am to 4pm the collection will be open to the general public to celebrate the birthday of **Guglielmo Marconi** who was born 25 April, 1874.

The Chelmsford Amateur Radio Society (CARS) will be operating a demonstration station, call sign GX0MWT, in the historic Marconi 2MT Writtle broadcast hut which is now housed inside the museum.

On the first floor **Colin Page, G0TRM** and his team will be demonstrating the impressive Mechanical Morse and Morse Key display with the opportunity for the youngsters to try their hand at sending Morse. The Morse punched paper tape sending and decoding process always proves to be a big hit with potential junior CW operators.

Dr Elizabeth Bruton will give a talk titled 'Communications and Signals Intelligence: the use of Wireless at the Battle of Jutland, 1916'. The Battle of Jutland, which took place on 31 May and 1 June 1916, was the sole naval battle between the British and German forces during World War One with the immediate and long-term outcomes being much debated 100 years later. An aspect of that debate is the impact of wireless and related forms of signals intelligence including signals interception as well as wireless direction. As we approach the centenary of the battle, Dr Bruton will reconsider and re-evaluate the use and impact of wireless communications upon the battle, in particular decisions made by the British commanders.

Sandford Mill is run with the help of the Friends of Chelmsford Museums and other ex-industry volunteers. It relies on the support of several voluntary bodies including Chelmsford Amateur Radio Society, the Radio Officers Association, the Marconi Veterans Association and the Susan Trust. Susan is the last wooden Chelmer Barge and is undergoing restoration (financed by funds devotedly raised by the Susan Trust), before returning to her moorings at Sandford Mill.

Trusted experts

I was looking at a recent edition of Micro Mart. I haven't seen that magazine for ages, but had one loaned to me. I saw an article on how to extend your laptop battery life and it trotted out all the obvious things like unplug or remove any USB sticks or external drives etc., and replacing your original battery pack with one that has double the original amount of cells. (Presumably, these are in parallel or the laptop would get hot and bothered, but why they don't just fit higher capacity cells in the same package, I don't know).

The real gem, though, was to recommend an SSD, or solid state drive. Yes, these consume less power but not for the reasons stated in the article, where it is said it is because they spin less. Yes, as in infinitely less, as anything divided by zero results in infinity (ask Buzz Lightyear!) ***Ed***.

Thieving bar stewards?

I came out of Danbury Village Hall after a training meeting recently and walked across the road to the car park where I normally leave the car and found, to my horror, that someone had apparently nicked it!

Then I remembered I had parked it in front of the Village Hall.

There's no hope… ***Ed***.

The Battle of Jutland

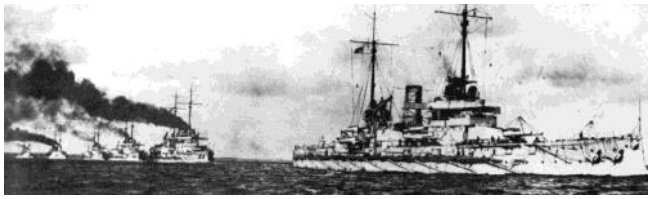
On Friday 22 April 2016, Dr Elizabeth Bruton from Jodrell Bank Discovery Centre, University of Manchester will give an evening lecture at former Marconi Hall Street factor, Chelmsford, 7.30pm and Marconi Day afternoon lecture at Sandford Mill museum, Saturday 23 April 2016 on:

Communications and Signals Intelligence: the use of wireless at the Battle of Jutland, 1916.

The Battle of Jutland, which took place on 31 May and 1 June 1916, was the sole naval battle between the British and German forces during World War One with the immediate and long-term outcomes being much debated 100 years later. Another aspect of the battle which is much debated upon until the present day is the impact of wireless and related forms of signals intelligence including signals interception as well as wireless direction. As we approach the centenary of the battle, she will reconsider and re-evaluate the use and impact of wireless communications upon the battle, in particular decisions made by the British commanders.

Dr Elizabeth Bruton has given talks in Chelmsford on previous occasions and is to be recommended. She is a passionate and experienced speaker on the history of science and technology, history of communication, and World War One. She has appeared on several BBC TV science programmes and radio broadcasts, including 'Shock and Awe' on BBC4 and Melvyn Bragg's 'In our Time' on BBC Radio 4. She is Heritage Officer at Jodrell Bank Discovery Centre and former co-curator and researcher for Harry's Story: Henry Moseley, a scientist lost to war at the Museum of the History of Science, Oxford. She also held the 2014-2015 Byrne-Bussey Marconi Visiting Fellowship at the Bodleian Library, University of Oxford.

See https://oxford.academia.edu/ElizabethBruton for further details.



Feeder corrosion

I guess most of us have seen this. I recently examined some coax that had been allowed to get water into the outer braid and, as I stripped it back to try and find clean copper, I was surprised to find just how far back it went, and the extent to which the braid had become blackened by the corrosive action. Also, the degree to which the connector had corroded, too. The extent of the corrosion in terms of physical length could easily be explained by surface tension and the capillary action of the water and fine mesh braid, but the coal blackness?

If I put a piece of copper into a glass of water and left it there for months, I wouldn't expect that to happen, but I might, if I applied a voltage and allowed that to electrolyse the water and degrade the copper. Is that, then, the reason why the copper becomes so badly affected? Any coax on a practical antenna system is going to have an SWR associated with it and with 100W(+) being transmitted, there will almost certainly be some high voltages generated which may cause the problem.

If the feeder SWR is high and we use an "ATU" to match the mismatch seen on the feeder to the Tx, then the voltages could indeed be huge, as the available power into the feeder is allowed to increase beyond what the Tx would tolerate if it fed the coax directly.

Does anyone have a handle on this? I tried to Google some answers but came up with nothing. I know there is at least one chemist amongst the CARS members, so how about generating an informed theory?

Ed.